IAS TUM Institute for Advanced Study

European Commission

High-Resolution Insights into Amyloid Cell Toxicity

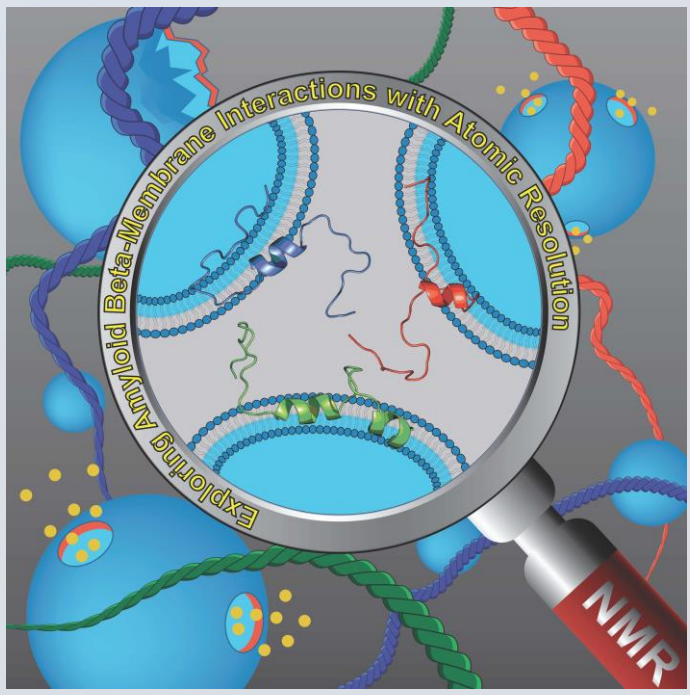
Inaugural Lecture by Hans Fischer Senior Professor Ayyalusamy Ramamoorthy

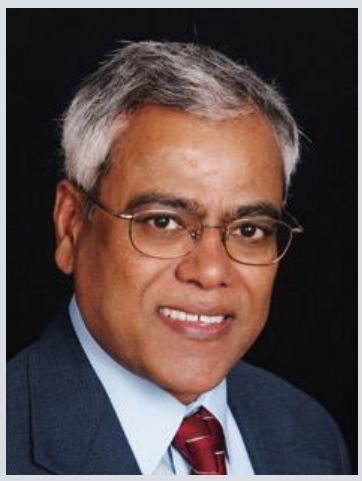
Monday, April 25, 2016 | 17:00 | TUM-IAS Faculty Club

Amyloid deposits characterize more than twenty different clinical syndromes, including Alzheimer's and Type II Diabetes, each of which is associated with a distinct peptide or protein capable of misfolding, aggregating, and forming characteristic amyloid fibrils. Increasing evidence suggests that the amyloid toxicity is due to intermediates generated during the assembly process of amyloid fibers, which have been proposed to attack cells in a variety of ways.

Our research in this area has been focused on amyloid-induced cell toxicity by examining the early events in the aggregation and membrane disruption of amyloid proteins islet amyloid polypeptide (*IAPP*, associated with Type II diabetes) and Alzheimer's amyloid-beta (*Ab*). By using a variety of biophysical and biochemical approaches including cutting-edge high-resolution solution and solid-state NMR techniques, we investigate the roles of oligomers, metals, protein-lipid interaction and membrane composition on amyloid toxicity.

High-resolution structural and mechanistic insights into cell toxicity, and the effects of small molecular compounds to inhibit amyloid toxicity will be presented. Many challenges posed by the transient and heterogeneous nature of amyloid intermediates and their interactions with the lipid membrane will also be discussed.





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